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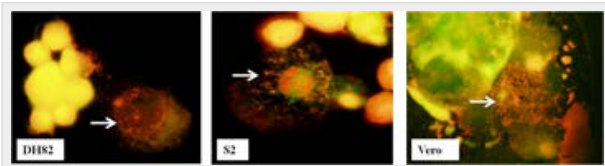
Written on NOVEMBER 10, 2011 AT 8:54 AM by PROSS

Rickettsial Research – Fighting the Bites of Fleas, Lice, Mites and Ticks

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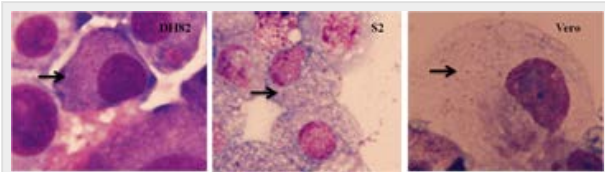
By Roxanne Charles, Naval Medical Research Center, Office of Legal and Technology Services



Acridine orange stain is used to show presence of rickettsiae in three different types of cells (DH82, S2, and Vero). Arrow indicates cell containing rickettsia.

There is a need for rapid, sensitive “real-time” identification and diagnostic tools to detect rickettsial infection and a need for FDA-approved vaccines to protect our warfighters and civilian populations. Epidemic typhus, scrub typhus, spotted fevers and ehrlichioses had a

debilitating impact on military personnel during both World Wars and the Korean and Vietnam conflicts. The bacteria that are responsible for these rickettsial diseases are transmitted by fleas, lice, mites and ticks. Current research efforts are underway to determine the prevalence of these diseases among troops serving in Operation Enduring Freedom and Operation Iraqi Freedom. For example, scrub typhus, which historically affected populations from Afghanistan and further east, is now spreading to the Middle East and even South America. In 2010, *Candidatus Rickettsia andeanae* was detected in a tick near the Portsmouth River in Virginia and since 1984, more than fourteen new types of rickettsial species have been discovered.



Diff-Quick staining of rickettsiae in three different types of cells (DH82, S2, Vero). Arrow indicates cell containing rickettsia.

To date, there is no vaccine for protection against rickettsial infections. Biomedical research that contributes to the prevention, diagnostic and vaccine development effort is an important component of Navy Medicine. In Silver Spring, Md., the Naval

Medical Research Center’s (NMRC’s) researcher, Dr. Wei Mei Ching, is leading a team to develop new, innovative and effective rickettsial diagnostic tests and potential vaccines that are now ready for commercial development. NMRC’s legal and technology transfer team, which connects researchers with private industry, has crafted multiple collaborations and licensing agreements with U.S. and international businesses to commercialize NMRC’s inventions. Currently, private industry has expressed keen interest in NMRC’s new

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generation of nucleic acid- and antibody-based assays to rapidly detect infection.

One of the challenges faced by our Navy Medicine research team was finding suitable cells to grow the bacteria, which could then be used for future experiments. Recently, infections were confirmed using a technique called quantitative polymerase chain reaction. Additionally, transmission electron microscopy and different cell-staining techniques produce images of the *Candidatus* R. andeanea that could be used to determine the size and the location of the bacteria within three different types of cells. This first successful cultivation of *Candidatus* R. andeanea in three distinct cell lines is an exciting step towards better characterizing and understanding the potential virulence of emerging rickettsia species.

We encourage companies interested in commercializing vaccines or diagnostic devices in this area to contact the NMRC. Whether you are interested in collaborations involving Navy Medicine’s unique research facilities in the U.S. and overseas or licensing Navy inventions, the NMRC Office of Legal and Technology Services can work with our researchers and interested companies to navigate the commercialization process.

You can contact us for an initial discussion at http://www.med.navy.mil/sites/nmrc/Pages/ott_main.htm.

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